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Global Disaster Movie Scientifically Implausible

The Day After Tomorrow Will Look Like Today

Hollywood's latest disaster movie, *The Day After Tomorrow*, offers plenty of thrills, eye-popping special effects, and drama. Yet the film-makers hope that it will do more than entertain: they actually intend for this "sci-fi flick" to prompt political action on global warming. The film portrays a climate gone berserk due to manmade global warming, a warming that leads to the next ice age. Confused? Don't worry, you're not alone.

The movie's director, Roland Emmerich, wants this film to be taken as a serious statement on the dangers of global warming.

"Film-makers have to choose a horror scenario and not an educationally valuable piece of enlightenment. Nevertheless, I went very far in order to provide viewers with lots of scientific information *My hidden dream is that this film will force politicians to act.* I've got a message which is so well-known that it isn't a real message anymore: We're not allowed to destroy our planet. The U.S. is the mightiest country in the world. And with George W. Bush, they have a president who cares for nothing but oil. How different would the world be today if the Democratic eco-politician Al Gore had won the presidency?"¹ [emphasis added]

Advocacy groups such as MoveOn.org are using the film as an opportunity to publicize their global warming agenda. In a teleconference with reporters, MoveOn.org's executive director, Peter Shurman, joined by former Vice President Al Gore, stated that *The Day After Tomorrow* is the "movie President Bush does not want you to see."² Gore believes the movie offers "a rare opportunity to have a national conversation about what truly should be seen as a global climate emergency." He said, "I hope this movie will provide many opportunities for in-depth conversations about what this issue is really all about."³

¹From an interview with Emmerich on *Spiegel Online* (translated from German), April 26, 2004. Emmerich is a German national.

²*CNSNews.com*, "Gore Warns of 'Climate Emergency' While Promoting Disaster Film," May 12, 2004.

³*CNSNews.com*, May 12, 2004.

Nonsensical “Science”

Emmerich’s science cannot be taken seriously. Gregg Easterbrook, a leading environmental reporter and editor of *New Republic Online*, believes the manmade global warming threat is real, but describes what he calls the “imbecile-caliber” science of this movie:

“Climate change caused by artificial greenhouse-gas accumulation initiates a preposterous instant planet-wide calamity. Enormous mega-tornadoes larger than any ever actually observed in nature appear from nowhere to level the city of Los Angeles. Hail larger than any ever actually observed in nature smashes Tokyo to ruins. The Antarctic ice sheets melt essentially instantaneously, creating a global tsunami that floods the world’s coastal cities. Then, *just three days* after the instantaneous melting of the ice caps, an instantaneous ice age hits northern latitudes, freezing the seawater that flooded coastal cities and leaving Manhattan under an instant glacier.”⁴

Easterbrook then describes in more detail the inconceivable meteorological events in New York City as portrayed in the movie:

“*The Day After Tomorrow* veers into total science illiteracy in its depiction of the instant freezing of New York City. Sea water sloshing over Manhattan solidifies in little more than moments, leaving the island’s skyscrapers encased in hundreds of feet of ice; people and vehicles are blast-frozen into place . . . Blast-freezing city-sized volumes of seawater – assuming this is physically possible at all – might require air temperatures of absolute zero or something close to it.”⁵

Oversimplified Model of the Gulf Stream

Despite such a preposterous portrayal of scientific events, the movie’s underlying premise is based in small measure on a hypothesis about the effects of global warming on ocean currents. Some scientists have suggested that warming could shut down Atlantic Ocean circulation.

The predominant circulation in the Atlantic Ocean – referred to variously as the Thermohaline Circulation, Atlantic Meridional Overturning, or the Gulf Stream – carries warm surface waters from the south to the north, thereby moderating European temperatures. As the surface waters travel northward, they become saltier and denser due to evaporation. In the North Atlantic, the denser water sinks and returns southward. If global warming caused enough Arctic sea ice to melt, the resulting freshwater discharge might reduce the saltiness of the water sufficiently to prevent it from sinking, which would shut down the ocean circulation. If this occurred, temperatures in Europe could decrease.

⁴Gregg Easterbrook, “Blast-Frozen Nonsense,” *New Republic Online*, May 10, 2004.

⁵Easterbrook, May 10, 2004.

But even if this scenario played out, it would not do so in the manner portrayed in the movie. According to Wallace Broecker of Columbia University, who first proposed the idea, “there is no reason to believe that the impacts could occur in a mere decade The time required for this to happen is more like a century.”⁶ And the amount of cooling in Europe would be no more than about 5 degrees Celsius (9 degrees Fahrenheit).⁷

Yet, this highly simplified model of the Atlantic Ocean circulation is the conceptual launching pad from which the movie takes off. The model is plausible only because some scientists speculate that something similar occurred 8,200 years ago when one of the largest glacial lakes of the Laurentide Ice Sheet, Lake Ojibway, drained into the North Atlantic, releasing enormous quantities of freshwater. As noted in the peer reviewed journal *Science*, however, “To our knowledge, unequivocal evidence that this event resulted in a substantial reduction of the AMO [Atlantic Meridional Overturning] has not yet been obtained.”⁸ The article continues:

“Because we cannot possibly foresee increases in freshwater inputs to the North Atlantic that could approach the magnitude of the Lake Ojibway discharge peak (the present Arctic river cumulative discharge rate is about two orders of magnitude lower), and because the effect of this even on the AMO is still unclear, further reference to the event [from 8,200 years ago] with respect to the reduction of the AMO in the near future seems irrelevant.”⁹

The article concludes, “In light of the paleoclimate record and our understanding of the contemporary climate system, it is safe to say that global warming will not lead to the onset of a new ice age.”¹⁰

One of the world’s leading experts on the Atlantic ocean current is Dr. Carl Wunsch, a professor of Physical Oceanography at MIT. In a letter to *Nature*, Wunsch describes a more complex ocean circulation and finds the simplified scenario described above as unlikely:

“European readers should be reassured that the Gulf Stream’s existence is a consequence of the large-scale wind system over the North Atlantic Ocean, and of the nature of fluid motion on a rotating planet. The only way to produce an ocean circulation without a Gulf Stream is either to turn off the wind system, or to stop the Earth’s rotation, or both.

“Real questions exist about conceivable changes in the ocean circulation and its climate consequences. However, such discussions are not helped by hyperbole and alarmism.

⁶Easterbrook, May 10, 2004.

⁷Mark Peplow, “Disaster Movie Makes Waves,” *Nature*, May 12, 2004.

⁸Andrew J. Weaver and Claude Hillaire-Marcel, “Global Warming and the Next Ice Age,” *Science*, April 16, 2004.

⁹Weaver and Hillaire-Marcel, April 16, 2004.

¹⁰Weaver and Hillaire-Marcel, April 16, 2004.

The occurrence of a climate without the Gulf Stream any time soon – within tens of millions of years – has the probability of little more than zero.”¹¹

“Little more than zero” – that’s a fairly low probability. Environmental advocates using Emmerich’s meteorological horror show to promote political action on global warming is about as reasonable as using his alien-invasion movie *Independence Day* as the basis for homeland security policy.

¹¹Carl Wunsch, “Gulf Stream Safe if Wind Blows and Earth Turns,” *Nature*, April 8, 2004.